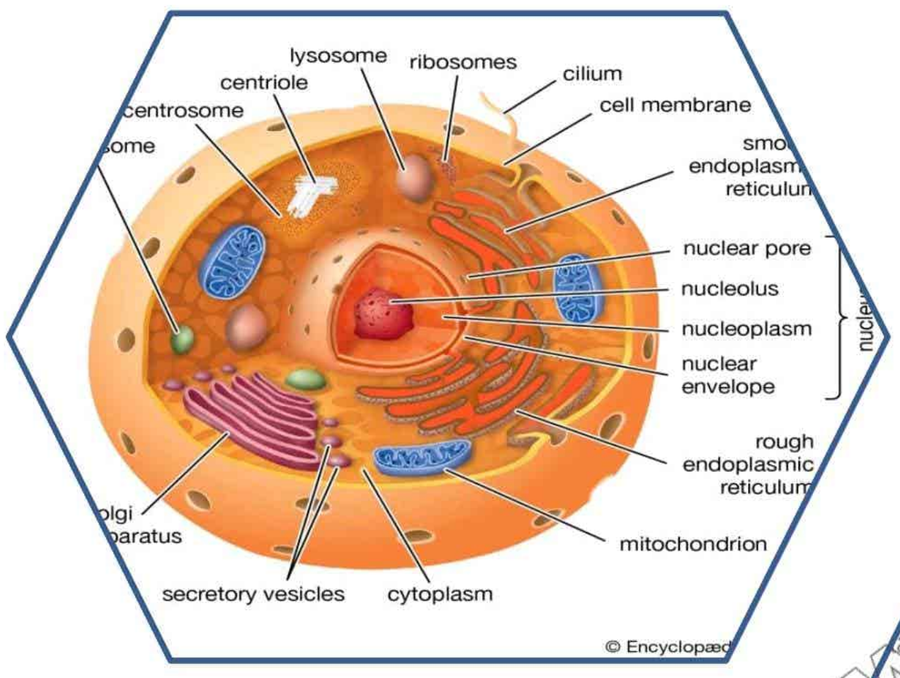
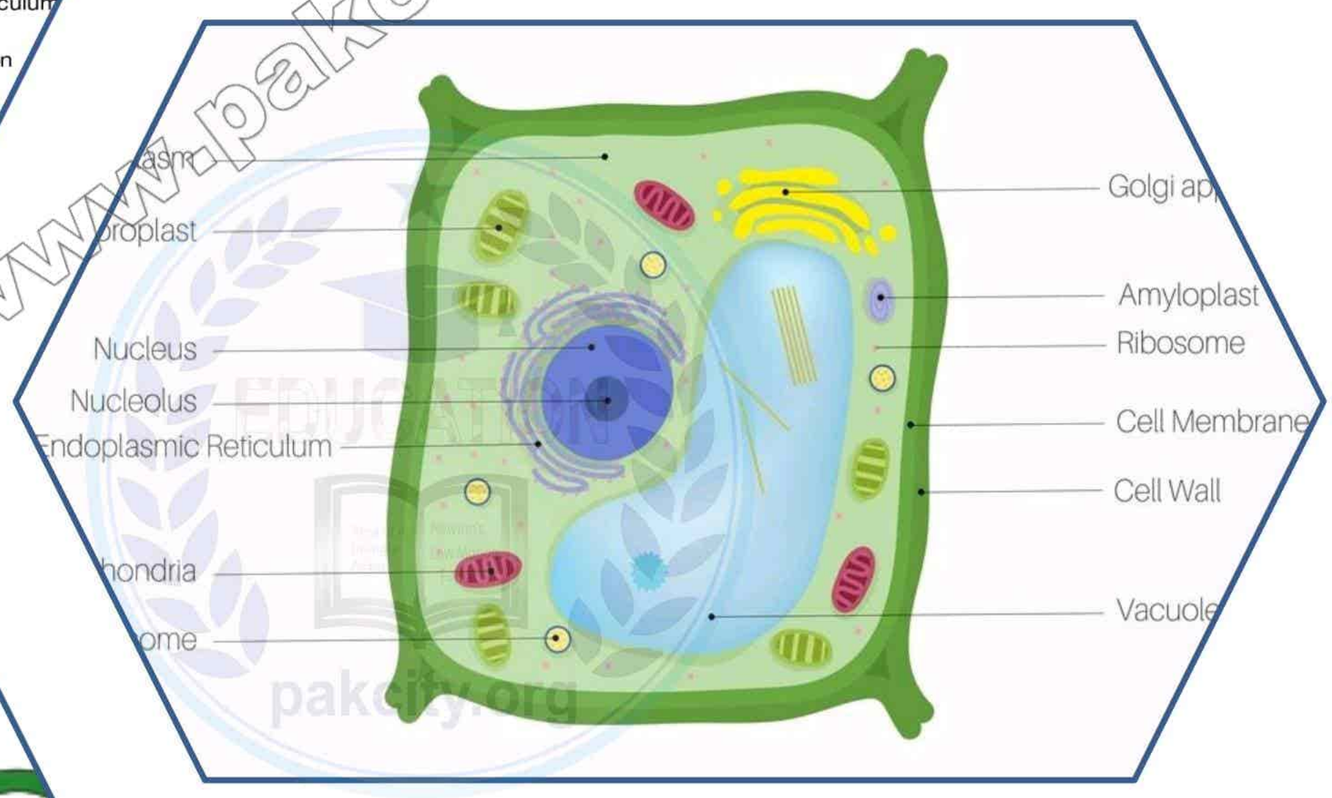
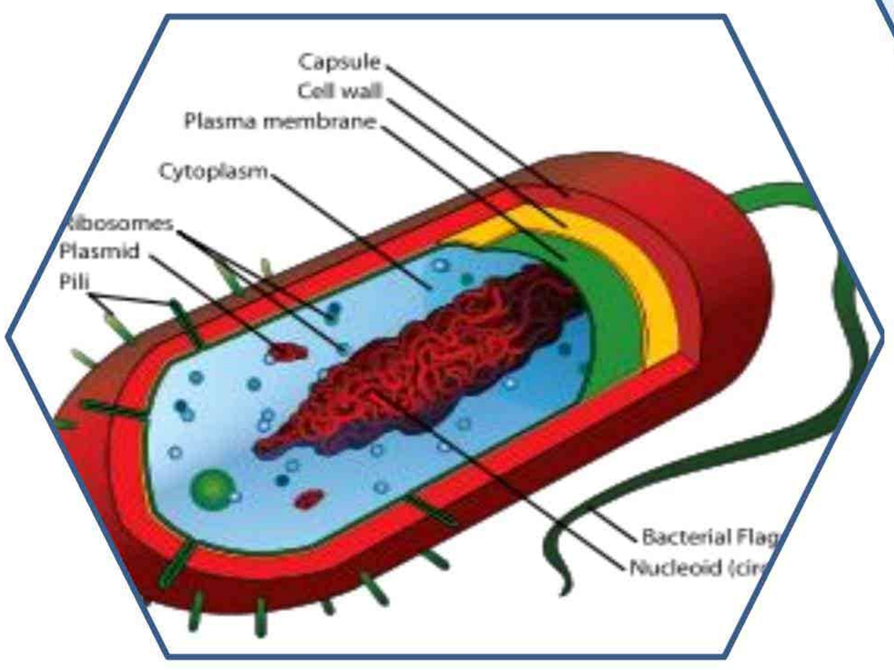
CHAPTER 4

The Cell



- **Exercise Short Answers**
- **Important Short Answers**





- Exercise MCQ's
- Important Additional MCQ's
- Past MDCAT MCQ's

Exercise MCQ's

❖ **Encircle the correct answer from the multiple choices.**

1) **Which statement about nuclear envelop is not true?**
   a) It has pores
   b) It is a double membrane structure
   c) Its inner membrane bears ribosomes
   d) RNA and some proteins pass through it
2) **Which statement about plastids is true?**
   a) They are surrounded by a single membrane
   b) They are powerhouse of cell
   c) They are found in all organisms
   d) They contain DNA and ribosomes
3) **Which type of the cell would probably be the most appropriate to study lysosomes?**
   a) Phagocytic white blood cells
   b) Nerve cell
   c) Mesophyll cell of leaf
   d) Muscle cell
4) **Which of the following pairs of structure-function is mismatched?**
   a) Ribosomes; protein synthesis
   b) Nucleolus; ribosome production
   c) Golgi; muscle contraction
   d) Lysosome; intracellular digestion
5) **Which of the following statement about ribosomes is correct?**
   a) They are structurally different from free ribosome.
   b) They are enclosed in their own membrane.
   c) They are concentrated in the cisternal space of rough ER.
   d) They are attached to cisternal surface.

Answer key:

1	c	**2**	d	**3**	a	**4**	c	**5**	d

Most important MCQ's

❖ **Encircle the correct answer from the multiple choices.**

Cell and Emergence of cell theory

1. **Robert Hook was the first person to see cells in:**
   a) Various plants b) Fungi c) Animals d) Cork
2. **Who coined the term CELL?**
   a) Schwann b) Schleiden c) Robert Hook d) Both a and b
3. **Micrographia is famous publication of:**
   a) Robert Hooke b) Robert Brown c) Robert Koch d) R. Virchow
4. **The presence of nucleus in the cell was reported by:**
   a) T.Schwann b) Louis Pasteur c) Robert Brown d) Virchow
5. **Who opposed the idea the cell is an empty space bounded by thick wall?**
   a) Lorenz Oken b) Schwann c) Robert Brown d) Rudolph Virchow
6. **Cell theory was finally formulated by:**
   a) Watson & Crick b) Schleiden & Schwann c) Lorenz Oken d) Pasteur
7. **The cell theory was proposed by:**
   a) Lorenz Oken b) Robert Brown c) Schleiden & Schwann d) Virchow
8. **"Omnis Cellula-e-cellula" was hypothesized by:**
   a) Schleiden b) Rudolph Virchow c) Louis Pasteur d) Lorenz Okan
9. **The concept "Omnis Cellula-e-cellula" means that, new cells are formed from:**
   a) Non-living material
   b) Pre-existing living cells
   c) Dead organic matter
   d) As a result of chemical reactions
10. **Who first observed and thus hypothesized that new cells are formed from previously existing living cell?**
    a) Theodor Schwann and Schleiden
    b) Rudolph Virchow
    c) Louis Pasteur
    d) Both b and c

Cell structure and Cell study

11. **A cell consists of basic components:**
    a) Plasma membrane b) Cytoplasm c) Nucleus d) All of these
12. **Which of the …….. cells store surplus food?**
    a) Chlorenchymatous b) Parenchymatous c) Sclerenchymatous d) Meristematic
13. **The resolution of human naked eye is:**
    a) 1 mm b) 1 µm c) 1 nm d) 1 cm
14. **Resolution of a typical compound microscope is:**
    a) 10 µm b) 2.0 µm c) 3.0 µm d) 4.0 µm
15. **Resolution of electron microscope ranges between:**
    a) 2-4 Angstrom b) 2-3 Angstrom c) 2-4 Angstrom d) 1-4 Angstrom
16. **Magnifying power of electron microscope as compared to eye is:**
    a) 500 X b) 250000X c) 500000X d) 250X
17. **In cell fractionation various components of cells including its organelles can be isolated in different layers depending upon:**
    a) Their physical properties like size & weight.
    b) Physical properties of the medium like its density.
    c) Their electrical properties like their charges.
    d) Both a and b
18. **The human naked eye can differentiate between two points which are _____ apart.**
    a) 1.0 mm b) 0.1 mm c) 1.0 cm d) 1.0 dm

Cell Membrane

19. **Plasma membrane is found in the cells of:**
    a) Animals only b) Plants only c) Both a & b d) Bacteria only
20. **Cell membranes are composed of:**
    a) Lipids & Proteins b) Lipids & terpenoids c) Proteins & Carbohydrate d) Phospholipids
21. **Cell membrane has 60-80 %:**
    a) Lipids b) Proteins c) Carbohydrates d) Vitamins
22. **The percentage of lipids in cell membrane is:**
    a) 60-80 % b) 30-60 % c) 20-40% d) 10-20%
23. **In many animal cell membrane helps to take in materials by infolding in the form of vacuoles. This type of intake is termed as:**
    a) Phagocytosis b) Pinocytosis c) Osmosis d) Endocytosis

24. Endocytosis which involves ingestion of solid material is:

a) Pinocytosis b) Phagocytosis c) Solidocytosis d) Both a & b

25. Process of taking in liquid materials by cell membrane is called:

a) Pinocytosis b) Phagocytosis c) Solidocytosis d) Exocytosis

26. By which of the following can movements of materials across animal cell membranes be accomplished?

a) Active transport only b) Diffusion only c) Pinocytosis only d) All of these

27. Which of the statement about cell membrane is not true?

a) It contains protein molecules embedded in lipid bilayer
b) It is a differentially permeable membrane.
c) It contains charged pores thus ions being charged particles cross cell membrane much easier than neutral particles.
d) It may get infolded to engulf solid or liquid material.

28. Movement of the material across the cell membrane which does not requiring expenditure of metabolic energy is called:

a) Active transport b) Passive transport c) Co-transport d) Counter transport

Cell Wall

29. Cell wall is secreted by the:

a) Nucleoplasm b) Protoplasm c) Centriole d) Glyoxisomes

30. Chitin is found in the cell wall of:

a) Algae b) Bacteria c) Fungi d) Plants

31. The first layer of cell wall which is formed is:

a) Primary wall b) Secondary wall c) Middle lamella d) All of these

32. Which is found in primary wall?

a) Silica b) Pectin c) Lignin d) Cutin

33. Which part of cells formed on inner surface of a plant cell at the end?

a) Primary cell wall b) Middle Lamella c) Secondary cell wall d) All

34. Which is not found in secondary cell wall?

a) Lignin b) Cutin c) Pectin d) Silica

35. All are related to secondary cell wall, except:

a) Cutin b) Silica c) Waxes d) Cellulose

36. A cell wall is present only in all organisms except:

a) Bacteria b) Protozoa c) Algae d) Viruses

37. Cellulose is the major component of:

a) Primary wall b) Secondary wall c) Middle lamella d) All of the above

38. Strengthening material of prokaryotic cell wall is:

a) Cellulose
b) Chitin
c) Inorganic salts silica waxes and lignin
d) Peptidoglycan or Murein.

Cytoplasm

39. The living substances of living beings is celled:

a) Cytoplasm b) Cell c) DNA d) Protoplasm

40. The plasma membrane and everything present within is:

a) Protoplast b) Plasmoplast c) Cytoplast d) Chloroplast

41. Soluble part of the cytoplasm is termed as:

a) Cisterna b) Endocytosis c) Cytosol d) Both a & b

42. Cyclosis and amoeboid movements are because of:

a) Microtubules b) Microfilaments c) Intermediate filaments d) Centriole

Endoplasmic Reticulum

43. The semi-circular channels and system of tubes found in the cytoplasm are known as:

a) Ribosomes b) Endoplasmic Reticulum c) Glyoxisomes d) Vacuoles

44. Endoplasmic reticulum contains a system of flattened membrane-bounded sacs which are named as:

a) Cristae b) Cisternae c) Matrix d) Tubules

45. Lipids synthesis / metabolism take place in which of the following organelle?

a) Mitochondria b) Vacuoles c) RER d) SER

46. Which of the following organelle is responsible for the transmission of impulses and detoxification of harmful drugs?

a) RER b) SER c) Ribosomes d) DNA

47. Spherical or tubular membranes which separate the material present in endoplasmic reticulum from that of cytoplasmic material are called:

a) Cytosol b) Cisternae c) Polysomes d) Cristae

48. Which is not the function of endoplasmic reticulum?

a) Nerve impulse conduction
b) Transport of material
c) Mechanical support
d) Synthesis of conjugated molecules

Ribosomes and Golgi complex

49. Ribosomes are particles of:
a) Riboglycoprotein b) Ribonucleoprotein c) Riboglycolipid d) Ribonucleolipid

50. Ribosomes have equal amount of:
a) DNA & Protein b) mRNA & Protein c) RNA & Protein d) None

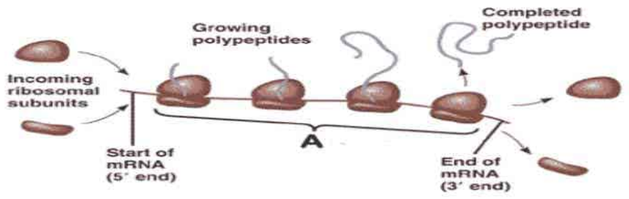
51. Ribosomes exists in two forms, either attached with the RER or freely dispersed in the:
a) Tonoplast b) Cytoplasm c) Golgi bodies d) SER

52. The structure is found attached to membranes in cell. It consists of 2 parts. Name it:
a) Golgi complex b) Mitochomdrion c) Lysosome d) Ribosome

53. The size of prokaryotic ribosomes is:
a) 30S b) 50S c) 70S d) 80S

54. Eukaryotic ribosomal subunits when combined make up:
a) 100'S particle b) 90'S particle c) 80'S particle d) 70'S particles

55. Which structure does represent the following diagram?
a) Euglena
b) Flagellum
c) Ribosomes
d) Polysome



56. A group of ribosome attached to mRNA is known as:
a) Peroxisomes b) Glyoxisomes c) Polysomes d) Lysosomes

57. The attachment of 2 subunits of ribosomes is controlled by:
a) Ca^{++} b) Fe^{++} c) Mg^{++} d) K^{+}

58. Golgi apparatus is concerned with cell:
a) Division b) Lysis c) Storage d) Secretion

59. Organelle …… is concerned with cell secretion:
a) Ribosomes b) Mitochondria c) Centriole d) Golgi complex

60. Which of the following modifies proteins and lipids by adding carbohydrates?
a) Golgi apparatus b) Plasma membrane c) Polysome d) None of these

61. Another name for Golgi complex is:
a) Cyto-membrane system b) Endoplasmic reticulum c) Dictyosome d) None of these

62. Which cell organelle lacks nucleic acid?
a) Chloroplast b) Mitochondria c) Golgi apparatus d) Ribosomes

63. Pancreas produces secretory granules that help in digestion. These granules after passing through endoplasmic reticulum are pinched off from _____ surface of Golgi apparatus:
a) Forming face b) Maturating face c) Any of them d) None of these

64. In Golgi apparatus the maturing face is:
a) Biconcave b) Convex c) Spherical d) Concave

Lysosomes

65. Lysosomes were isolated and studied for the first time by:
a) Palade b) De-Duve c) Golgi d) Virchow

66. Lysosomes were discovered by:
a) Schwann b) Virchow c) Golgi d) De-Duve

67. De-Duve discovered the cell organelle:
a) Mitochondria b) Lysosomes c) Ribosomes d) Chloroplast

68. Any foreign object that gain entry inside the cell is immediately engulfed by:
a) Lysosome b) Ribosomes c) Peroxisome d) Glyoxiosme

69. A tadpole's tail is gradually broken down during metamorphosis into an adult frog. Which organelle increases in number in cells of tail at this time:
a) Golgi Apparatus b) Lysosome c) Pinocytic vesicles d) Centriole

70. Tay-Sachs disease results due to accumulation in brain cells:
a) Mg ion b) Glucose c) Lipids d) RNA

71. During digesting the phagocytosed food particles vesicles formed from fusion of phagocytic vacuole with the enzymes secreted by Golgi apparatus are called:
a) Lysosomes b) Primary lysosomes c) Secondary lysosomes d) Food vacuole

72. Autophagosomes are:
a) Those lysosomes which eat parts of their own cells to generate energy.
b) Those lysosomes which eat old and worn out cellular organelles.
c) Lysosomes which help in extracellular digestion.
d) Both a and b

Peroxisome, Glyoxisomes and Vacuoles

73. The diameter of Peroxisomes is approximately:
a) 0.2 µm b) 0.3 µm c) 0.4 µm d) 0.5 µm

74. Hydrogen peroxide degradation in a cell is a function of:
a) Lysosome b) Ribosome c) Mitochondria d) Microbodies

75. Vacuole in plants is responsible for:

a) Photosynthesis b) Cellular excretion c) Turgor pressure d) Starch storage

76. Cellular organelles related with H_2O_2 are:

a) Glyoxisomes b) Lysosomes c) Peroxisomes d) Ribosomes

77. Which of the following statement is incorrect about Glyoxisomes?

a) They contain enzymes which help in conversion of fatty acids into carbohydrate
b) They are abundant in soyabeans but absent in pea.
c) They are present throughout life of a plant and provide them with energy through Glyoxylate cycle.
d) They are single membranous organelles.

Cytoskeleton and Centriole

78. The protein present in microtubules is:

a) Tropomyosin b) Myosin c) Tubulin d) Actin

79. When cross-section of centriole is observed, it shows as it consists of:

a) 9-microtubules b) 3-microtubules c) 11-microubules d) 6-microtubules

80. The cyclosis and amoeboid movements are due to:

a) Microtubules b) Microfilaments c) Intermediate filament d) All

81. **Which of the following is most slender in structure**?

a) Microtubules b) Intermediate filaments c) Microfilaments d) Both a & b

82. Which of the following cytoskeletal fiber contain tubulin protein?

a) One which help in assembly of spindles during mitosis.
b) One involved in internal cell motion.
c) One involved in maintenance of cell shape.
d) Both b and c

Mitochondria

83. Cristae are found in:

a) Golgi complex b) Endoplasmic reticulum c) Chloroplast d) Mitochondria

84. Inholdings of inner membrane of mitochondria are:

a) Cisternae b) Cristae c) Thylakoids d) Granum

85. The structure that are involved in the manufacture and supply of energy to the cell are:

a) Centrioles b) Nucleolus c) Plastids d) Mitochondria

86. Of the following which one is not the characteristic of mitochondria?

a) It contains F1 particles
b) It is involved in the synthesis of protein
c) It is a self-replicating organelle
d) Number of mitochondria is constant

87. Which of the following is not present in mitochondria?

a) Enzymes b) Co-enzymes c) Ribosomes d) Thylakoids

88. The stent energy in the form of ADP is regenerated by mitochondria into:

a) AMP b) ADP c) ATP d) All of these

Plastids

89. Plastids are present/found only in:

a) Bacteria b) Animal cell c) Virus d) Plant cell

90. In a plant cell chlorophyll is present in:

a) Chloroplasts b) Stroma c) Leucoplast d) Chloroplast

91. In photosynthetic plant cells, membrane bound structure containing green pigment is called:

a) Ribosome b) Nucleus c) Chloroplast d) Vacuoles

92. Stroma is fluid in the chloroplast:

a) Thylakoids b) Matrix c) Granum d) Integranum

93. The fluid which surrounds the thylakoids is called:

a) Matrix b) Stroma c) Cytoplasm d) Nucleoplasm

94. The part of chloroplast where CO_2 is fixed to manufacture sugar is:

a) Stroma b) Grana c) Thylakoid d) Outer membrane

95. Which statement about plasmid is true?

a) They are surrounded by single membrane
b) Power house of cell
c) They are found in all organisms
d) They contain DNA and Ribosomes

96. Which of the following are colorless?

a) Chloroplast b) Leucoplasts c) Chromoplasts d) None of these

97. Leucoplasts are a kind of:

a) Lysosomes b) Chloroplasts c) Plastids d) Grannum

98. The type of plastids which help in pollination is:

a) Chromoplasts b) Leucoplasts c) Chloroplasts d) All of these

99. Chlorophyll is a/an _____ molecule:

a) Inorganic b) Cationic c) Anionic d) Organic

100. Chlorophyll molecule contains _____ as central metal ion:

a) Fe2+ b) Mg2+ c) Zn2+ d) Cu2+

101. Which of the following impart a red color to Rose petals?

a) Chloroplast b) Chlorophyll c) Chromoplast d) Leucoplast

Nucleus

102. In generalized plant cell the nucleus is:

a) Present in the middle of the cell
b) Displaced to the site of the cell
c) Absent
d) Modified into endoplasmic reticulum

103. Generally the cells with more than two nuclei are called:

a) Mononucleate b) Multinucleate c) Binucleate d) Anucleate

104. Ribosomal RNA is synthesized and stored in:

a) Nucleolus b) Mitochondria c) Nucleus d) Chloroplast

105. New ribosomes are assembled in:

a) Cisternae b) Cristae c) Nucleolus d) Lysosomes

106. Which of the following statements about nuclear envelope is not true?

a) It has pores
b) It is double membrane structure
c) Its inner membrane bears ribosomes
d) RNA and some proteins pass through it

107. Erythrocytes have pores per Nucleus:

a) 3000 b) 30000 c) 6 or 8 d) 3 or 4

108. The nucleus contains:

a) Mitochondria b) Cytosol c) Enzymes d) DNA

109. A chromosome is composed of:

a) RNA b) DNA c) ATP d) NAD

110. Which structure does the following diagram represent?

a) Chromosome
b) Chromatid
c) Centrosome
d) Centromere

111. The number of chromosomes in fruit fly, *Drosophila melanogaster* is:

a) 8 b) 18 c) 28 d) 16

112. Germ cells of Drosophila have chromosomes:

a) 26 b) 4 c) 8 d) 16

113. The scientific name of onion is:

a) Allium cepa b) Cassia fistula c) Solanum nigrum d) Homo sapiens

114. The number of chromosomes in Frog is:

a) 24 b) 26 c) 28 d) 30

115. The number of chromosomes in Chimpanzee is:

a) 44 b) 46 c) 48 d) 50

116. The number of chromosomes in Potato:

a) 48 b) 50 c) 52 d) 54

117. The number of chromosomes in Garden pea:

a) 8 b) 10 c) 12 d) 14

Answer key:

1	d	**2**	c	**3**	a	**4**	c	**5**	c	**6**	b	**7**	c	**8**	b	**9**	b	**10**	b
11	d	**12**	b	**13**	a	**14**	b	**15**	a	**16**	b	**17**	d	**18**	a	**19**	c	**20**	a
21	b	**22**	c	**23**	d	**24**	b	**25**	a	**26**	d	**27**	c	**28**	b	**29**	b	**30**	c
31	a	**32**	b	**33**	c	**34**	c	**35**	d	**36**	b	**37**	a	**38**	d	**39**	d	**40**	a
41	c	**42**	b	**43**	b	**44**	b	**45**	d	**46**	b	**47**	b	**48**	d	**49**	b	**50**	c
51	b	**52**	d	**53**	c	**54**	c	**55**	d	**56**	c	**57**	c	**58**	d	**59**	d	**60**	a
61	c	**62**	c	**63**	b	**64**	d	**65**	b	**66**	d	**67**	b	**68**	a	**69**	b	**70**	c
71	c	**72**	d	**73**	d	**74**	d	**75**	c	**76**	c	**77**	c	**78**	c	**79**	a	**80**	b
81	c	**82**	a	**83**	d	**84**	b	**85**	d	**86**	d	**87**	d	**88**	c	**89**	d	**90**	d
91	c	**92**	b	**93**	b	**94**	a	**95**	d	**96**	b	**97**	c	**98**	a	**99**	d	**100**	b
101	c	**102**	b	**103**	b	**104**	a	**105**	c	**106**	c	**107**	d	**108**	d	**109**	b	**110**	a
111	a	**112**	b	**113**	a	**114**	b	**115**	c	**116**	a	**117**	d						

Prof. Ijaz Ahmed Khan Abbasi (Lecturer Biology PGC)

MDCAT MCQ'S

2008

1) The soluble part of the cytoplasm is termed as:

a) Cisternae b) Endocytosis c) Cytosol d) Both a & b

2) Which of the following modifies proteins and lipids by adding carbohydrates?

a) Golgi apparatus b) Plasma membrane c) Polysome d) None of these

3) Which one of the following is most slender in structure?

a) Microtubules b) Intermediate filaments c) Micro filaments d) Both a and b

4) Which of the following are colorless?

a) Chloroplasts b) Leucoplasts c) Chromoplasts d) None of these

5) Name the one involved in DNA replication:

a) Cysts b) Ribosomes c) Mesosomes d) Spores

2009

6) A group of ribosomes attached to messenger RNA is known as:

a) Ribosome b) Nucleosome c) Lysosome d) Polysome

7) Tay-Sach's disease is due to the presence of an enzyme that is inverted in the catabolism of:

a) Proteins b) Ascorbic Acid c) Carbohydrates d) Lipids

2010

8) Microtubules of spindle fibres are composed of a protein called:

a) Tubulin b) Myosin c) Actin d) Troponin

9) In prokaryotic cell, wall strengthening material is:

a) Cellulose b) Chitin c) Silica d) Peptidoglycan

2011

10) Which of the following organelles is concerned with the cell secretion:

a) Ribosomes b) Lysosomes c) Golgi Apparatus d) Mitochondria

11) The inner membrane of mitochondria is folded to form finger like structure called:

a) Cristae b) Matrix c) Vesicle d) Cisternae

12) Interior of chloroplast is divided into heterogeneous structure, embedded in the matrix known as:

a) Grana b) Thylakoids c) Stroma d) Cisternae

2012

13) Plastids are only found in the:

a) Animals and Plants b) Plants c) Animals d) Viruses

14) Plasma membrane is chemically composed of:

a) Phospholipids only b) Lipids and carbohydrates c) Lipids and proteins d) Glycoproteins

15) Endoplasmic reticulum contains a system of flattened membrane-bounded sacs which are named as:

a) Cristae b) Cisternae c) Marks d) Tubules

16) Lipids synthesis / metabolism take place in which of the following organelle?

a) Mitochondria
b) Rough endoplasmic reticulum
c) Vacuoles
d) Smooth endoplasmic reticulum

17) Ribosomes exist in two forms, either attached with RER or freely dispersed in the:

a) Tonoplast b) Cytoplasm c) Golgi bodies d) SER

18) The ribosomal RNA is synthesized and stored in:

a) Endoplasmic reticulum b) Golgi complex c) Nucleolus d) Chromosomes

19) Mesosomes are infoldings of the cell membrane and are involved in:

a) DNA replication b) Protein synthesis c) RNA synthesis d) Metabolism

2013

20) The process by which unwanted structures within the cell are engulfed and digested within the lysosome is known as:

a) Endocytosis b) Hydrolysis c) Exocytosis d) Autophagy

21) The function of nucleolus is to make:

a) rDNA b) RNA c) Ribosomes d) Chromosomes

22) Lipid metabolism is the function of:

a) Mitochondria b) RER c) Sarcoplasmic reticulum d) SER

23) The enzymes of lysosomes are synthesized on:

a) RER b) Chloroplast c) SER d) Golgi Apparatus

24) Centrioles are made up of _____ microtubules:

a) 9 b) 3 c) 27 d) 12

25) Which of the following structures is absent in higher plants and found in animal cells:

a) Centriole b) Mitochondria c) Cytoskeleton d) Cytoplasm

26) The soluble part of cytoplasm or fluid that remains when all organelles are removed is known as:

a) Solution b) Cytoskeleton c) Gelatin material d) Cytosol

27) The outer membrane of the nuclear envelope is at places continuous with the:

a) Golgi apparatus b) Lysozymes c) Endoplasmic Reticulum d) Peroxisomes

2014

28) During animal cell division, the spindle fibres are formed from:

a) Mitochondria b) Ribosomes c) Centrioles d) Lysosomes

29) Which component of the cell is concerned with cell secretions?

a) Plasma membrane b) Cytoskeleton c) Golgi complex d) Mitochondria

30) Peptidoglycan or murein is a special or distinctive feature of cell wall in:

a) Algae b) Bacteria c) Fungi d) Plants

31) In mitochondria, small knob-like structures called F1 particles are found in:

a) Outer membrane b) Inner membrane c) Outer compartment d) Inner compartment

32) The intake of liquid materials across the cell membrane is:

a) Phagocytosis b) Pinocytosis c) Endocytosis d) Exocytosis

33) Which one of the following is the site of oxidative phosphorylation in mitochondria?

a) Cristae b) Outer membrane c) Matrix d) Ribosomes

34) Organelle involved in the synthesis of ATP is:

a) Ribosome b) Nucleus c) Mitochondria d) Centriole

2015

35) Which one of the following cell structure is involved in the synthesis of lipids?

a) Endoplasmic Reticulum b) Centriole c) Golgi Complex d) Mitochondria

36) Ribosomes are tiny organisms, which are involved in the synthesis of:

a) Protein b) Nucleus c) RNA d) Nucleosome

37) Which organelle is bounded by two membranes?

a) Ribosome b) Lysosome c) Mitochondria d) Nucleolus

38) At the beginning of nuclear division, the number of microtubule triplets in two pairs of centrioles that migrate to opposite poles are:

a) 9 b) 108 c) 18 d) 36

2016

39) The rapid exchange of materials through carrier proteins across the plasma membrane is called:

a) Passive Diffusion b) Endocytosis c) Active Transport d) Facilitated Diffusion

40) The inner membrane of mitochondria form extensive infoldings called:

a) Cristae b) Lamella c) Cisternae d) Bifidae

41) Which one of the following organelle is found in both prokaryotic and eukaryotic cells?

a) Centriole b) Nucleus c) Endoplasmic Reticulum d) Ribosome

42) _____ is an invagination of cell membrane which helps in cell division.

a) Fimbriae b) Mesosome c) Nucleoid d) Endospore

43) Out of the given options, choose the one which shows the structures found only in plants:

a) Vacuole, Chloroplast, Ribosomes
b) Chloroplast, Cell Wall, Vacuole
c) Chloroplast, Microtubules, Peroxisomes
d) Chloroplast, Cell Wall, Mitochondria

44) Presence of large central vacuole is the characteristic of:

a) Prokaryotes b) Fungi c) Protists d) Plants

45) The basic structure of plasma membrane is provided by:

a) Proteins b) Cytoskeleton c) Cholesterols d) Phospholipids

46) The organelle involved in detoxification of drugs and poisons in the liver cells is:

a) Smooth Endoplasmic Reticulum
b) Golgi Apparatus
c) Rough Endoplasmic Reticulum
d) Lysosomes

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47) Select the organelle which is only present in animal cells:

a) Centrioles b) Microtubules c) R.E.R d) Ribosomes

48) Which of the structures is present in both plant and animal cells but is absent in prokaryotic cells:

a) Centrioles b) Plastids c) Microtubule d) Sieve-tubes

49) DNA molecule in prokaryotes is:

a) Single, circular, double stranded molecule not bound by membrane
b) Double, circular molecule
c) Linear double stranded molecule
d) Single, circular, double stranded, membrane bound

50) Nucleoid is a structure not found in:

a) Campylobacter b) Spirochete c) Cyanobacteria d) Goblet cells

51) Ribosomes present in prokaryotes are:

a) 80S b) 50S c) 60S d) 70S

52) Functionally mesosomes can be compared with:

a) Ribosomes b) Polysomes c) Mitochondria d) Golgibodies

Answer key:

1	c	**2**	a	**3**	d	**4**	b	**5**	c
6	d	**7**	d	**8**	a	**9**	d	**10**	c
11	a	**12**	a	**13**	b	**14**	c	**15**	b
16	d	**17**	b	**18**	c	**19**	a	**20**	d
21	c	**22**	d	**23**	a	**24**	c	**25**	a
26	d	**27**	a	**28**	c	**29**	c	**30**	b
31	b	**32**	b	**33**	a	**34**	c	**35**	c
36	a	**37**	c	**38**	d	**39**	d	**40**	a
41	d	**42**	b	**43**	b	**44**	d	**45**	d
46	a	**47**	a	**48**	c	**49**	a	**50**	d
51	d	**52**	c						

Exercise Short Answers

Q:1 Describe various movements involved in the transport of materials across the cell membrane.

Ans: Movements involved in the transport of materials across the cell membrane.

1. **Non-facilitated transport:**
   Non polar molecules (e.g. fatty acids) move through the membrane freely from lipid bilayer. This is non facilitated transport.
2. **Facilitated transport:**
   Polar molecules (e.g. water) move through the membrane with the help of proteins. This is facilitated transport. It has two types:
   i. **Active transport:**
   It is the transport of molecules across the membrane from lower to higher concentration by using energy.
   ii. **Passive transport:**
   It is the transport of molecules from high to low concentration by diffusion; its two types are:
   a) **Diffusion:** Solutes move from high to low concentration by diffusion.
   b) **Osmosis:** The movement of water molecules (solvent) from high to low concentration through selectively permeable membrane is called osmosis.
3. **Endocytosis:**
   The inward movement of the materials by infolding of cell membrane in the form of vacuole is called endocytosis. Its two types are:
   a) **Phagocytosis:** If solid particles are taken in then it is phagocytosis.
   b) **Pinocytosis:** If materials are taken in then it is pinocytosis.
4. **Exocytosis:**
   If transportation takes place from cell to outside or to other cells then it is exocytosis. For example secretions or removal of waste.

Q:2 State various structural modifications in a cell involved in secretions.

Ans: Secretions are the products produced within the cell on ribosomes and then passed to the outside through endoplasmic reticulum and Golgi apparatus. The secretions are converted into finished product and are packed inside membrane, before passing out.

Q:3 List the processes blocked by mitochondria failure in a cell.

Ans: The processes that blocked by mitochondrial failure in a cell are:

1) Krebs cycle
2) Electron transport chain
3) Fatty acid metabolism

Due to blockage of these processes production of ATP is stopped.

Q:4 What will happen if a chromosome loses its centromere?

Ans: It will become a functionless degenerated chromosome. It will not attach with spindle fibers during cell division.

Q:5 How does autophagy help in converting a tadpole larva into an adult amphibians?

Ans: Autophagy is the breakdown of cell organelles. During this process some old and worn out parts of a cell are digested. In this way old cell materials are used and cell is renewed. Same way tail and some other structures are broken down and disappear and an adult amphibian appear.

Q:6 Is there any similarity between bacterial and plant cell wall?

Ans: The polysaccharides in bacterial cell wall and cellulose in plant cell wall are carbohydrates.

Important Short Answers

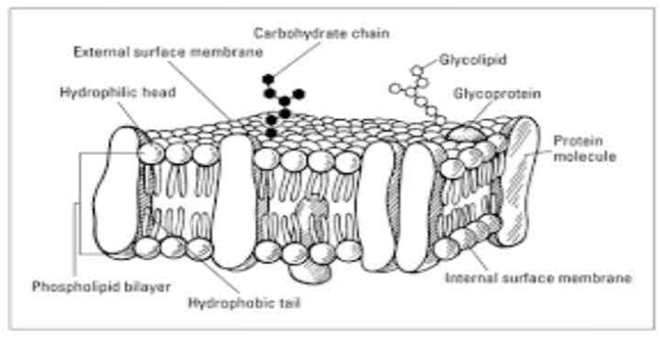
Q:1 Write down the salient features of Cell Theory?

Ans: Salient features of Cell Theory:

1) All organisms are composed of one or more cells.
2) All cells arise from pre-existing cells.
3) Cell is the basic structural as well as functional unit for all organisms.

Q:2 What is Fluid Mosaic Model of Cell Membrane?

Ans: Fluid Mosaic Model of Cell Membrane:



According to fluid mosaic model of cell membrane,

Proteins layers are not continuous and confined to the surface of membrane and not sandwiching lipid bilayer, instead protein molecules are embedded in the lipid bilayer of fluid nature in a mosaic manner.

- This is the most accepted model.

Q:3 Difference between Diffusion and Osmosis.

Diffusion	Osmosis
• It is the movement of particles molecules or ions from higher concentrated region (higher free energy region) to their lower concentrated region (lower free energy region).	• It is the movement of solvent or water from the area of its higher concentrated region to its lower concentrated region through a semi-permeable membrane.
• It can occur in any type of medium.	• It occurs only in liquid medium.
• Diffusing molecules may be solids liquids or gases.	• It involves the movement of solvent molecules only.
• It does not require a semi-permeable membrane.	• It requires a semi-permeable membrane.
• It is purely dependent upon the free energy of diffusing substances only.	• It depends upon the free energy (Chemical Potential) of the solvent present on the two sides of the semi-permeable membrane.
• Equilibrium in the free energy of diffusing molecules is achieved in the end.	• Equilibrium in the free energy of solvent molecules is never achieved.

Q:4 Differentiate between Power of Resolution and Magnification.

Power of Resolution	Power of magnification
1) Human naked eye can differentiate between two points that are at least 1 mm apart. 2) So this closet distance between two closer points is called resolution power/ resolution of eyes. This resolution can be increased with the aid of lenses. 3) Naked eye resolution is 1 mm. 4) Compound microscope resolution is 2µm. 5) Electron microscope resolution is 2-4 Angstrom.	1) It is the power by which we can see the things larger than with our naked eye. 2) The magnification power of microscope is determined by multiplying X values of ocular lens and X value of objective lense. Therefore, a microscope with (10X40=400X) 400X magnifying power. 3) Naked eye magnification is 1X. 4) Compound microscope magnification is 1X. 5) Electron magnification is 2,50,000 X greater than that of naked eye.

Q:5 Differentiate between Plant and Animal cell.

Plant cell	Animal Cell
• Contain cell wall.	• No cell wall.
• Centriole is absent.	• Centrioles present.
• Large central vacuole present.	• No large central vacuole present.
• Plastids are present.	• Plastids absent.
• Nucleus is peripheral.	• Nucleus is central.
• Glyoxysome present.	• Glyoxysome absent.

Q:6 Differentiate between Primary and Secondary cell wall.

Primary Cell Wall	Secondary Cell Wall
• It is composed of cellulose and some pectin and hemicelluloses.	• It is composed of inorganic salts, silica, waxes cutin, lignin etc.
• The cellulose molecules are low in content but arranged in a criss-cross arrangement.	• Cellulose molecules are high in content.
• Primary wall is true cell wall. It develops in the newly growing cells.	• The secondary wall is found between primary wall and cell membrane.
• It is not much thick or rigid (a bit elastic).	• It is much thick and rigid.
• Primary wall is living.	• Secondary wall is non-living.
• All plants have a primary cell wall.	• Only woody plants have a secondary cell wall.

Q:7 Differentiate between Prokaryotic and Eukaryotic cell.

Prokaryotic Cell	Eukaryotic Cell
• Cell is smaller than eukaryotic cell.	• Cell is larger than prokaryotic cell.
• DNA is not separated from the cytoplasm by a membrane.	• DNA is bound within nucleus with a membrane separating it from the cytoplasm.
• .DNA is not packaged into chromosome.	• DNA is wound tightly around proteins and packaged into compact units called chromosomes.
• It is characterized by few membranous organelles.	• It has highly organized membrane bound organelles.
• Cytoskeleton is about in prokaryotic cell.	• It is supported by internal protein cytoskeleton.
• It has small sized ribosome of 70S.	• It has large sized ribosomes of 80S.
• The cell wall of prokaryotic cell is composed of peptidoglycan which consists of a carbohydrate matrix (polymers of sugar) that is cross-linked by short polypeptide chains.	• Cell wall if present contains of either cellulose or chitin.

Q:8 Is there any similarity between Bacterial and Plant Cell Wall?

Ans: Similarity between Bacterial and Plant Cell Wall: Yes, following similarities are found between bacterial and plant cell wall:

a) Both do not act as barriers to materials passing through it.
b) Both, cellulose found in plant cell wall and polysaccharide as a constituent of peptidoglycan present in the bacterial cell wall is carbohydrate.
c) Both are non-living.

Q:9 Write chemical composition of plasma membrane?

Ans. Chemical composition of Plasma Membrane: Plasma membrane is chemically composed of:

I. Proteins 60-80%
II. Lipids 20-40%
III. Carbohydrates small quantity

Q:10 Write briefly on differentially permeable membranes.

Ans: Differentially (Selectively) Permeable Membrane means that certain substances can move across the membrane while other cannot. The plasma membrane is differentially membrane. Certain substances can freely pass through the membrane, and others cannot. Moreover in response to varying environmental conditions or cell needs, a membrane may be a barrier to a particular substance at one time and actively promote the passage at another time.

Q:11 What is cytosol?

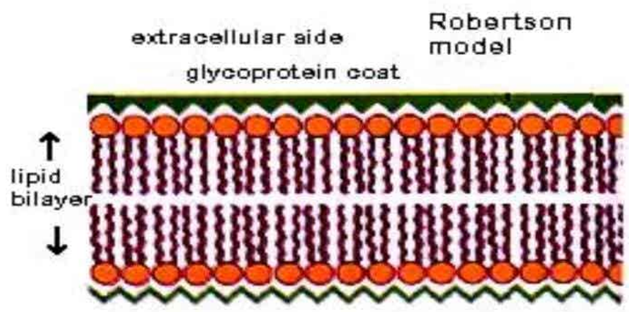
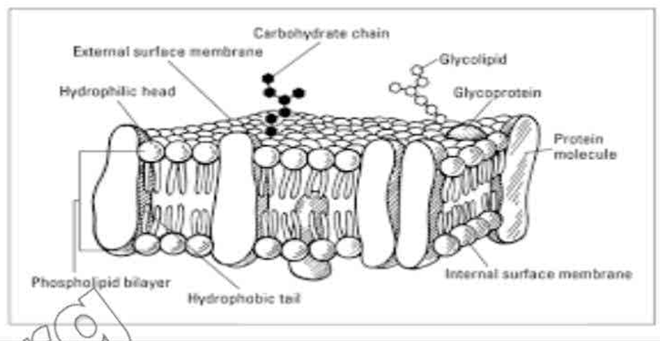
Ans: Cytosol:

- Cytosol literally means cell solution in which the organelles reside.
- It is the soluble part of cytoplasm.
- It forms the ground substance of the cytoplasm.
- Chemically it is composed of 90% water.
- It forms a solution containing all fundamental molecules of life
- In the cytosol small molecules and ions may form true solution and some large molecules from colloidal solution.

Q:12 Differentiate between Gel and Sol.

Gel	Sol
• Viscous colloidal solution of cytoplasm is called gel.	• Non-viscous colloidal solution of cytoplasm is called sol.
• Peripheral parts of cell are gel like.	• Central parts of cell are sol.

Q:13 Differentiate between Unit Membrane and Fluid Mosaic Models.

Unit Membrane	Fluid Mosaic Models
• It was discovered by Danielle Davison & Robertson.	• It was proposed by Singer & Nicholson.
• According to this model, "Plasma membrane is made up of lipid bilayer surrounded by two layers of proteins like a sandwich."	• According to this model, "Protein molecules are embedded in the lipid bilayer in a mosaic manner."
• It does not explain the transport of materials across the cell.	• It explains transport of materials.
• It was least accepted model.	• It was thoroughly accepted.
	

Q:14 Write functions of cell wall?

Ans: Functions of cell wall:

- It provides support to the cell.
- It gives a definite shape to the cell and keeps it rigid.
- Cell wall does not act as barrier to the materials passing through it.
- Cell wall becomes rough and may be involved in the formation of wood after the death of cell.
- It prevents the cell from osmotic lysis.
- It helps in translocation of materials e.g. imbibition etc.

Q:15 Write functions of Cytoplasm?

Ans: Functions of Cytoplasm:

- It acts as a storehouse for many vital functions.
- It also stores waste products before their discharge out of the body or cell.
- It is a site for certain metabolic processes such as glycolysis. It contains enzymes for the glycolytic pathways of oxidation of glucose i.e. anaerobic respiration.
- Following cell organelles are present in the cytoplasm of living cells i.e. Endoplasmic reticulum Ribosomes, Mitochondria, Golgi apparatus, Lysosomes, Centriole, Plastids, Peroxisome, Vacuole, Cytoskeleton.

Q:16 Write functions of Endoplasmic Reticulum?

Ans: Endoplasmic Reticulum:

- RER is involved in the synthesis of exportable proteins.
- RER can store Proteins.
- SER is involved in the metabolism of different types of molecules (lipids).
- SER helps in detoxification of harmful drugs.
- SER in muscle cells and nerve cells is responsible for transmission of impulses.
- SER also plays a role in the transport of materials from one part of the cell to other.
- Endoplasmic reticulum provides mechanical support to the cell so that it's shape is maintained.

Q:17 Differentiate between Rough Endoplasmic Reticulum and Smooth Endoplasmic Reticulum.

Rough Endoplasmic Reticulum	Smooth Endoplasmic Reticulum
• RER is rough from with attached ribosomes.	• SER is smooth form without ribosomes.
• It is tubular in shape.	• It flattened sac-like in shape.

• RER is also called granular endoplasmic reticulum.	• SER is also called agranular endoplasmic reticulum.
• It helps in the metabolism of different types of molecules particularly lipids.	• It is involved in protein synthesis.
• It is not involved in transport of material.	• It is involved in transport of materials from one part of the cell to the other.
• It is found in steroid producing cell like adipose cells.	• It occurs mostly in protein synthesizing cells.

Q:18 Define Polysomes.

Ans: Polysomes:

The group of ribosome/s (small ribosomal subunit) attached to mRNA so as to form a complex for protein synthesis is called polysomes.

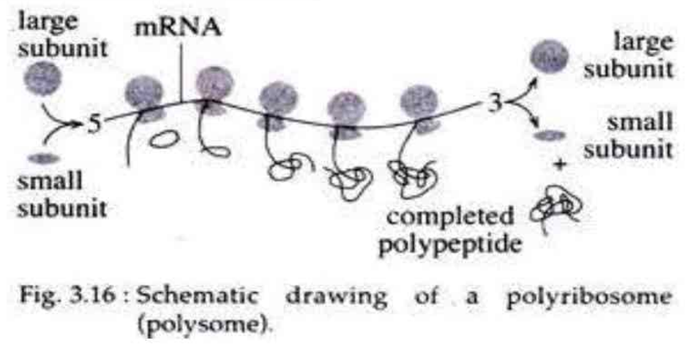


Fig. 3.16 : Schematic drawing of a polyribosome (polysome).

- It is also known as Polyribosome.
- This complex of ribosomes is formed during translation.

Q:19 Differentiate between Ribosome and Polysomes.

Ribosomes	Polysomes
• Cell contains many tiny granular structures known as ribosomes.	• A group of ribosomes attached to same messenger RNA is known as polysomes.
• Ribosomes are always present in cell.	• .Polysomes is only formed during translation.
• Function: Ribosomes may or may not read an mRNA at any given time.	• Function: Polysomes read an mRNA translate it into protein.

Q:20 What is Golgi apparatus?

Ans: Golgi apparatus:

- Golgi apparatus consists of stacks of flattened, membrane bound sacs called cisternae.
- Connected with cisternae are vesicles called Golgi vesicles.
- These cisternae along with vesicles are called Golgi complex.
- It was discovered by Camillo Golgi in 1898.
- It is found in all eukaryotic cells.
- In plants, it is also called dictyosomes.

Q:21 Write functions of Golgi apparatus.

Ans: Functions of Golgi apparatus:

- Golgi apparatus is involved in formation of cell secretions. Secretions are products formed within the cell on ribosomes and then passed to the outside through ER and Golgi complex.
- It is also the place where particular chemicals (secretions) are converted into finished products, concentrated and packed, before export. For example in mammals the pancreas secretes granules containing enzymes that help in digestion. The Golgi complex has a role in the formation of these granules.
- The most of important function of this apparatus is to modify the proteins and lipids by adding carbohydrates and converting them into glycoprotein and glycolipids.
- Golgi apparatus also modifies existing glycoproteins and glycolipids made in RER.
- It also manufacturers certain macromolecules by itself such as polysaccharides or cell plate material in plant cell are Golgi products.
- In animal cells, the Golgi complex also manufacturers lysosomes.

Q:22 Differentiate between Cisternae and Cristae.

Cisternae	Cristae
• Cisternae are flattened membrane bound sacs in the Endoplasmic Reticulum as well as in Golgi complex.	• The inner membrane infoldings of mitochondria are called cristae.
• Cisternae contain enzymes that are involved in the detoxification of various chemicals, metabolism of lipids and various modifications of proteins.	• Located on the surface of the cristae are particular enzymes involved aerobic cellular respiration.
• Their terminal portion is pinched off and forms transport vesicles that transport materials from E.R to Golgi complex to lysosome or cell membrane.	• .They do not pinch off in transport.
• They do not have F1 particles.	• The inner surface of cristae has small knob like F1 particles.
• These are involved in formation of secondary granules.	• These are involved in ATP production in respiratory chain.

Q:23 Differentiate between Endocytosis and Exocytosis?

Endocytosis	Exocytosis
• In endocytosis material are taken into the cell.	• In exocytosis, materials are exported out of the cell.
• Plasma membrane forms vesicles or vacuole.	• Vesicles fuse with plasma membrane and becomes its part.
• Plasma membrane used in the formation of vacuoles or vesicles is regenerated.	• This is also the primary mechanism by which plasma membranes grow larger.
• Endocytosis is common in unicellular organisms such as Amoeba. Three different types of endocytosis take place in human to take in the material in solid as well as in fluid form.	• In animal cells, exocytosis provides mechanism for secreting many hormones, neurotransmitter, digestive enzymes and other substances. In plant cells, it is important means of exporting materials needed to construct cell wall through the plasma membrane.

Q:24 What is lysosomes? Give its function.

Ans: Lysosomes:

Lysosomes is a single membrane bound simple sac rich in acid phosphatase and several other hydrolytic enzymes and is produced by the Golgi apparatus.

Functions of Lysosomes:

- It protects the cell from invading organisms. The cell engulfs the foreign organisms as phagocytic vacuole. This phagocytic vacuole fuse with the primary lysosome to form secondary lysosome in which various lysosomal enzymes digest the foreign organisms.
- In many kinds of cells lysosome is known to combine with food vacuole taking a part in intracellular digestion.
- Sometimes it engulfs some old worn out parts of cell, such as mitochondria, as autophagosome in which its enzymes digest them to generate energy, a process termed as autophagy.
- It plays a part in the normal development of an organism. For example as a tadpole slowly changes into a frog, the cell of tail are destroyed by the action of enzymes of lysosome.
- It also releases enzymes for extracellular digestion.

Q:25 Differentiate between Primary lysosome and Secondary lysosome.

Primary lysosome	Secondary lysosome
• The hydrolytic enzymes are synthesized on Rough Endoplasmic Reticulum and are future processed in the Golgi apparatus. These processed enzymes are budded off as Golgi vesicles and are called as primary lysosomes.	• The phagocytic vacuoles fuse with the primary lysosomes to form digestive vacuoles. These digestive vacuoles and autophagosomes are known as secondary lysosomes.
• Primary lysosomes are small	• Secondary lysosomes are large.
• Primary lysosomes contain inactive digestive enzymes in the form of granules	• Secondary lysosomes contain active digestive enzymes.
• Primary lysosomes are unable to eliminate their content to the outside	• Secondary lysosomes can eliminate their content to the outside of the cell.

Q:26 Difference between Phagocytosis and Pinocytosis.

Phagocytosis	Pinocytosis
• When the materials are taken in by endocytosis is large or solid the process is called phagocytosis.	• When materials are taken in by endocytosis is liquid or dissolved, the process is called pinocytosis.
• Phagocytosis can be seen with the light compound microscope.	• Electron microscope must be used to observe pinocytosis.
• Phagocytosis is common in unicellular organisms such as Amoeba. It also occurs in human by lecucocytes.	• Blood cells, cells that line the kidney tubules or the intestinal walls all use pinocytosis to ingest substances.

Q:27 Differentiate between Autophagy and Autophagosome.

Autophagy	Autophagosome
• It is a process of self-eating. • Autophagy is a process which plays an important role in recycling cellular material, and destroying nonfunctional organelles and proteins of cytoplasm.	• The lysosomes which eat parts of their own cell are known as autophagosome. • Autophagosome digest some worn out parts of the cell or old organelles such as mitochondria.

• During autophagy some old and worn out cells such as mitochondria are engulfed by the primary lysosomes as autophagosomes and are digested by enzymes of lysosomes.	• They are secondary lysosomes. They are involved in autophagy.

Q:28 What is autophagy? How it is beneficial for the cell?

Ans: Autophagy: Self eating process of cell is called autophagy.

Benefits:

Lysosomes are also involved in the autophagy. During this process some old, worn out parts of cell, such as old mitochondria are digested . In this way, materials of cell may be recycled and cell may be renewed. Their enzymes can also result in degeneration of cell, as may occur during some developmental processes. Lysosomes also release enzymes for extra cellular digestion.

Q:29 Define storage disease. Give at least two examples.

Ans: **Storage disease:**

Several congenital disease have been found to be due to accumulation within the cell of substances such as glycogen or various glycolipids. These are also called storage disease and are produced by a mutation that effect one of the lysosomal enzymes involved in the catabolism of a certain substance.

Examples of storage disease:

1) **Tay Sach's disease:** Tay Sach's disease is because of absence of Hexoseaminidase enzyme that is involved in the catabolism of lipids. Accumulation of lipids in brain cells lead to mental retardation and even death.
2) **Glycogenosis Type II:** It is one of storage disease in which the liver and muscles appear filled with glycogen within membrane bound organelles. In this disease, an enzyme that degrades glycogen to glucose, is absent.

Q:30 Who first isolated peroxisomes? Briefly describe the structure of peroxisomes.

Ans: De Duve and coworkers isolated in 1965 particles from liver and other tissues which were enriched with some oxidative enzymes, such as peroxidase, catalase, glycolic acid oxidase and some other enzymes.

Structure of peroxisomes:

These are single membrane enclosed endoplasmic organelle found both in animal and plants cells. These are characterized by containing H_2O_2 - producing oxidases and catalase. They are approximately 0.5 micro meter in diameter. They have also been found in protozoa, yeast and many cell types of higher plants.

Q:31 Differentiate between Peroxisomes and Glyoxisome.

Peroxisomes	Glyoxisome
• They are specifically involved in formation and decomposition of H_2O_2 (Hydrogen peroxide) in the cell that's why they are named peroxisomes.	• In plant seedlings they convert stored fatty acids to carbohydrates (succinate). This is achieved through glyoxalte cycle, the enzymes of which are located in the glyoxisome; hence they are termed glyoxisome.
• These particles are enriched with some oxidative enzymes, such as peroxidase, catalases, glycolic acid oxidase and some other enzymes.	• In addition to glycolic acid oxidase and catalase, also possess a number of enzymes that are not found in animal cells.
• It is present both in plant and animals i.e. they have also been found in protozoa, yeast and many cell types of higher plants.	• This organelle is present only in plants.
• These particles were isolated in 1965 from liver cells, other tissues.	• These were discovered in seedlings rich in lipids.

Q:32 Define vacuole. Also give its functions.

Ans: Vacuole: Vacuoles are bounded by single membrane and are formed by coalescence of small vacuoles during plants growth and development.

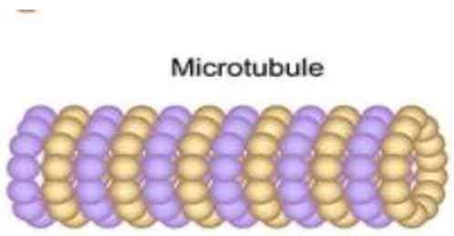
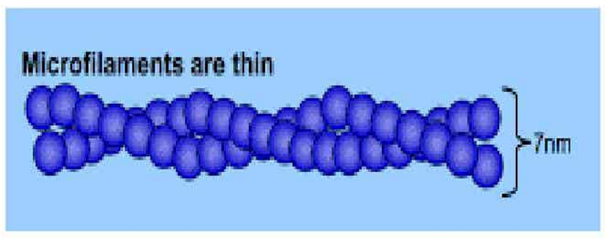
Functions of vacuole:

- Vacuole acts as site for storage of water and cell products or metabolic intermediates.
- The plant vacuole is the major contributor to the turgor that provides support to the individual plant cell and contributes to the rigidity of the leaves and younger parts of the plant.
- Vacuoles expand plant cell without diluting its cytoplasm.
- Vacuoles help in transport of materials within plants.

Q:33 Why mitochondria is called power house of the cell?

Ans: Mitochondria extract energy from different components of food and convert it in form of ATP. This energy is used for various cellular activities. The spent energy is in form of ADP is regenerated by mitochondria into ATP. As mitochondria are involved in manufacture and supply of energy to the cell. So they are called power house of the cell.

Q:34 Differentiate between Microtubules and Microfilaments.

Microtubules	Microfilaments
• Microtubules are cylindrical in shape.	• Microfilaments are cylindrical and flexible, thread like structure.
• They are composed of Tubulin proteins.	• They are composed Contractile protein e.g. Actin, myosin etc.
• Their size is up to 15 nm.	• Their size is up to 7 nm.
• They are involved in the formation of spindles during cell division.	• They are involved in movement of structure i.e. Cyclosis and amoeboid movement.
	

Q:35 What is stroma and what is its function?

Ans: Stroma: Stroma is a fluid which surrounds a thylakoids.

- It contains proteins, some ribosomes and a small circular DNA.
- Stroma covers most of the volume of chloroplast.

Functions of Stroma:

- It is the part of the chloroplast where CO2 is fixed to manufacture sugars.
- Some proteins are also synthesized in this part.

Q:36 Write down the role of centriole?

Ans: Role of centriole:

- Centriole play important role in the location of furrowing during cell division
- It play important role in the formation of cilia.
- Centrioles are duplicated before cell division and may play a role in some types of microtubule assembly.
- They give rise to the basal bodies of cilia and flagella.

Q:37 Differentiate between Outer and Inner Membrane of Mitochondria.

Outer Membrane of Mitochondria	Inner Membrane of Mitochondria
• Outer membrane is smooth.	• Inner membrane is highly folded.
• No Cristae is formed by it.	• The tightly packed inward folds of inner membrane are called Cristae.
• It lacks F1particles.	• Knob like F1 particles are embedded in the folds of inner membrane.
• Outer membrane consists mostly of phospholipids, considerable amount of cholesterol and some amount of protein.	• Inner membrane is very rich in proteins and has less amount of lipid.
• Proteins (enzymes) in the outer membrane carry out various reactions in the fatty acid metabolism and phospholipid biosynthesis and some are responsible for some oxidation reactions.	• Most of oxidative reactions occur on inner membrane.

Q:38 What is nucleolus?

Ans: Nucleolus: It is darkly stained body within the nucleus, and is without any membranes to separate it from the rest of the nuclear material. They are composed of two regions:

1. The peripheral granular area composed of precursors of ribosomal subunits.
2. The central fibril area consisting of large molecules weight RNA and rDNA.

Q:39 Define the terms Thylakoids and Grana.

Ans: Thylakoids: Thylakoids are flattened vesicles which arrange themselves to form grana and intergrana.

Grana: A granum appears to be a pile of thylakoids stacked on each other like coins.

- On an average, there are 50 or more thylakoids piled to form one granum. Membranes of the gran are sites where sunlight energy is trapped and where ATP is formed.

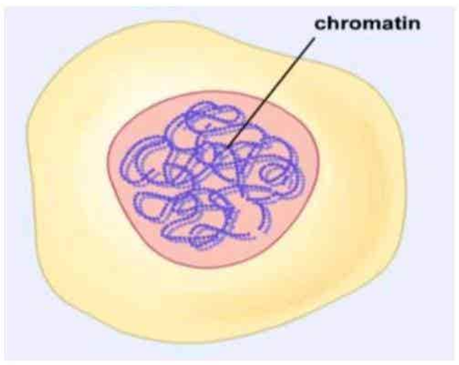
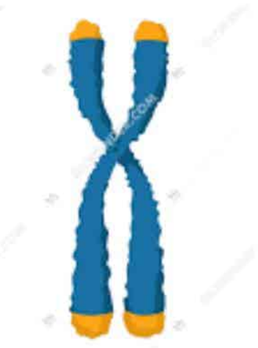
Q:40 What is Plastids. Also differentiate between Chromoplast and Leucoplasts.

Ans: Plastids: Membrane bounded, mostly pigment containing bodies present in the cell and are called plastids.

- Plastids are present in plant cells only.

Chromoplast	Leucoplast
• They are present in petals of flower and in ripened fruits and may be round, oval etc. in shape.	• They are found in underground parts of the plants. They are triangular, tubular or of some other shape.
• They give colors to plants other than green.	• They are colorless.
• They are involved in pollination and dispersal of seed.	• Their function is t store food

Q: 41 Differentiate between Chromatin and Chromosome.

Chromatin	Chromosomes
• During interphase, chromosomes are in the shape of chromatin network. • They lose their ability to stain. • They are loosely coiled fibers. • Their delicate membrane is disorganized and look disappeared. 	• Chromosomes are stained heavily hence visible only during cell division. • . Chromatin fibre condenses and coils up into structures called chromosomes (Gk; Chroma=color & Soma=body), which are thick enough to be seen with a light microscope. Under electron microscope, chromosomes appear to be rod-like structures containing a centromere. • Each chromosome is bounded by delicate membrane. 

Q:42 How nuclear pores are formed? What is its function.

Ans: The outer and inner membranes are continuous at certain points resulting in the formation of pores, the nuclear pores. The nuclear pores allow the exchange of materials between the nucleus and the cytoplasm.